

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claim 1. (Currently Amended): A DNA construct containing two different coding sequences of a fertility restorer gene, both of which encode the same protein product, the first of said sequences being a naturally occurring wild type gene sequence and the second of said sequences being a modified sequence generated by modification of the wild type sequence using codon degeneracy for expression in crop plants to avoid homology between the modified sequence and the wild type sequence at the DNA and mRNA levels so as to reduce susceptibility to homology-based post-transcriptional gene silencing, said wild type and said modified gene sequences being under the control of different tissue-first and second tapetum-specific promoters,

wherein said different tissue first and second tapetum-specific promoters having have overlapping temporal expression patterns in male reproductive tapetum tissues of said crop plants,

wherein said first tapetum-specific promoter is used to express a male sterility gene in corresponding male sterile plants, and

wherein expression from said second tapetum-specific promoter begins earlier than said first tapetum-specific promoter.

Claim 2. (Currently Amended): A construct as claimed in claim 1 further comprising:

(i) a first transcription unit comprising the wild type sequence of the restorer gene under transcriptional control of [[a]] said first tissue tapetum-specific promoter, which is used to express a male sterility gene in corresponding male sterile plants, and fused to a transcription termination signal including a polyadenylation signal,

(ii) a second transcription unit comprising a modified sequence of the restorer gene under transcriptional control of [[a]] said second tissue tapetum-specific promoter and fused to a transcription termination signal including a polyadenylation signal, and

(iii) a third transcription unit comprising a selectable marker gene under transcriptional control of a strong constitutive promoter and fused to a transcription termination signal including a polyadenylation signal[[.,.]]
~~wherein the first and second tissue specific promoters have overlapping temporal expression patterns in male reproductive tissues of said crop plants.~~

Claim 3. (Original): A construct as claimed in claim 2 wherein the restorer gene is a sequence encoding a protein capable of inhibiting or negating the cytotoxic effects of another protein generated by a lethal gene sequence.

Claim 4. (Previously Presented): A construct as claimed in claim 2 wherein the restorer gene encodes a protein selected from the group consisting of *barstar* and protease inhibitors.

Claim 5. (Original): A construct as claimed in claim 1 wherein said crop plants are dicotyledonous plants.

Claim 6. (Original): A construct as claimed in claim 1 wherein said crop plants are monocotyledonous plants.

Claim 7. (Previously Presented): A construct as claimed in claim 5 wherein said first wild type gene is a *barstar* gene comprising the nucleotide sequence as shown in SEQ ID NO: 1.

Claim 8. (Previously Presented): A construct as claimed in claim 7 wherein said second modified gene is a modified *barstar* gene comprising the sequence as shown in SEQ ID NO: 3.

Claim 9. (Currently Amended): A construct as claimed in claim 2 wherein tissue tapetum-specific promoters of the first and second transcription units are selected from the group consisting of TA29, A9, A3, tap1, and bcp1 promoters.

Claim 10. (Currently Amended): A construct as claimed in claim 2 wherein the preferred first tissue-tapetum-specific promoter is a TA29 promoter, and the preferred second tissue-tapetum-specific promoter is an A9 promoter.

Claim 11. (Original): A construct as claimed in claim 2 wherein the selectable marker gene is selected from the group of herbicide resistance-conferring genes consisting of *bar* gene, *ALS* gene and *tfdA* gene, or from the group of antibiotic resistance-conferring genes consisting of *nptII* gene, *hpt* gene and *aadA* gene.

Claim 12. (Previously Presented): A construct as claimed in claim 2 wherein the strong constitutive promoter for expression of the *bar* gene is selected from the group consisting of CaMV35S single enhancer promoter, CaMV35S double enhancer promoter, mirabilis mosaic virus (MMV) promoter, and figwort mosaic virus (FMV) promoter.

Claim 13. (Previously Presented): A fertility restorer transgenic plant, or parts or seeds thereof, each of which contain in their nuclear genome the construct of claim 2.

Claim 14. (Original): The transgenic plant as claimed in claim 13 which is selected from the group consisting of dicotyledonous plants and monocotyledonous plants.

Claim 15. (Original): The plant as claimed in claim 14 wherein said dicotyledonous plant is *Brassica juncea*.

Claim 16. (Currently Amended): A method to obtain efficient fertility restorer lines in crop plants for hybrid seed production, said method comprising the steps of:

(i) regenerating transformed plants from plant cells transformed transforming the nuclear genome of plant cells with a DNA construct containing two different coding sequences of a fertility restorer gene both of which encode the same protein product, the first of said sequences being a naturally occurring wild type gene sequence and the second of said sequences being a modified sequence generated by modification of the wild type

sequence using codon degeneracy for expression in dicotyledonous crop plants to avoid homology between the modified sequence and the wild type sequence at the DNA and mRNA levels so as to reduce susceptibility to homology-based post-transcriptional gene silencing, said DNA construct comprising:

- a) a first transcription unit comprising the wild type sequence of the restorer gene under transcriptional control of a first tissue-tapetum-specific promoter, which promoter is used to express a male sterility gene in corresponding male sterile plants, wherein said restorer gene sequence is fused to a transcription termination signal, including a polyadenylation signal,
- b) a second transcription unit comprising a modified sequence of the restorer gene under transcriptional control of a second tissue-tapetum-specific promoter and fused to a transcription termination signal including a polyadenylation signal, and
- c) a third transcription unit comprising a selectable marker gene under transcriptional control of a strong constitutive promoter and fused to a transcription termination signal including a polyadenylation signal;

wherein the first and second tissue-tapetum-specific promoters have overlapping temporal expression patterns in male-reproductive tapetal tissues of said crop plants;

wherein said first tapetum-specific promoter is used to express a male sterility gene in a corresponding male sterile plant; and

wherein expression from said second tapetum-specific promoter begins earlier than said first tapetum-specific promoter,

- ii) regenerating transformed plants from said transformed plant cells;
- [(iii)] (ii) identifying transformed plants having a single copy of the DNA construct,
- [(iv)] (iii) crossing the above single copy plants with male sterile *barnase* lines,
- [(v)] (iv) subjecting the F1 progeny obtained from crosses between *barnase* and *barstar* lines to molecular analysis to identify fertility restored plants, and
- [(vi)] (v) testing pollen viability of fertility restored plants to determine extent of restoration.

Claim 17. (Currently Amended): [[A]] The method as claimed in claim 16 wherein said crop plants are dicotyledonous plants.

Claim 18. (Currently Amended): [[A]] The method as claimed in claim 31, wherein said restorer lines in *Brassica juncea* are generated by *Agrobacterium*-mediated transformation using disarmed Ti plasmid.

Claim 19. (Currently Amended): [[A]] The method as claimed in claim 17 wherein said transformed plants having a single copy of said DNA construct are identified by Southern hybridization.

Claim 20. (Currently Amended): [[A]] The method as claimed in claim 17 wherein prior to said molecular analysis of said F1 progeny, said F1 progeny are analysed and segregated to identify plants containing the marker gene and said marker gene containing F1 plants are analysed for segregation of male-fertile and male-sterile phenotypes on the basis of pollen production and selfed seed formation.

Claim 21. (Currently Amended): [[A]] The method as claimed in claim 17 wherein subsequent to said testing of pollen viability of fertility restorer plants, the restored plants are self pollinated to obtain F2 progeny.

Claim 22. (Currently Amended): [[A]] The method as claimed in claim 17 wherein said F2 progeny are analysed under field conditions for segregation of male fertile and male sterile phenotypes to confirm the male sterile-restorer combination.

Claim 23. (Currently Amended): [[A]] The method as claimed in claim 17 wherein the preferred restorer gene is *barstar* gene.

Claim 24. (Currently Amended): [[A]] The method as claimed in claim 17 wherein said first wild type gene comprises the nucleotide sequence as shown in SEQ ID NO: 1.

Claim 25. (Currently Amended): [[A]] The method as claimed in claim 24 wherein said second modified gene comprises the sequence as shown in SEQ ID NO: 3.

Claim 26. (Currently Amended): [[A]] The method as claimed in claim 17 wherein the preferred first *tissue-tapetum*-specific promoter is a TA29 promoter.

Claim 27. (Currently Amended): [[A]] The method as claimed in claim 17 wherein the preferred second *tissue-tapetum*-specific promoter is an A9 promoter.

Claim 28. (Currently Amended): [[A]] The method as claimed in claim 17 wherein the preferred marker gene is *bar* gene.

Claim 29. (Currently Amended): [[A]] The method as claimed in claim 17 wherein the preferred constitutive promoter is CaMV35S double enhancer promoter.

Claim 30. (Currently Amended): [[A]] The method as claimed in claim 16 wherein said crop plants are monocotyledonous plants.

Claim 31. (Previously Presented): The method as claimed in claim 17, wherein said dicotyledonous plant is *Brassica juncea*.